

JOURNAL OF THE BOMBAY NATURAL HISTORY SOCIETY

December 2001

Vol. 98

No. 3

INDIAN WILD ASS (*EQUUS HEMIONUS KHUR*) IN THE LITTLE RANN OF KUTCH, GUJARAT, INDIA¹

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(With two text-figures)

Key words: Indian wild ass, Little Rann of Kutch, Gujarat

The Little Rann of Kutch is a unique saline desert and is synonymous with the Indian wild ass, locally called ghor khar. The numbers of this only population of *Equus hemionus khur* Lesson in the world, declined consistently as a result of disease and habitat loss before the declaration of the area as a Sanctuary. Though original habitat continued to be lost due to invasion of *Prosopis chilensis*, grazing, salt-works and encroachment, the wild ass population increased consistently after 1976. As per various estimates and censuses in the past, the population decreased from 3,000-4,000 in 1946, to a few hundreds in 1963. But a reverse trend set in after 1976, when the number increased from about 720 in 1976 to about 2,940 in 1998. The rate of population growth of this species was about 4.8% per year during the last decade and wild asses started dispersing to new areas away from the Sanctuary in the Great Rann of Kutch and Bhal regions. Wild asses were also seen in the Kala Dungar area of the Great Rann, Bhal region and in areas of Rajasthan bordering Gujarat. This paper deals with the population trend, distribution, migration and population characteristics of the wild ass. Encounters in different habitat types revealed that though the barren Rann does not provide food and water, it is an important habitat for the wild ass. Attempts were also made to study the habitat utilisation pattern and management problems of the Sanctuary for conservation of the wild ass in the region.

INTRODUCTION

There are three species of wild ass in the world, one in Africa and two in Asia. The African species has two subspecies, whereas the two Asian species are classified into eight surviving subspecies: *Equus hemionus hemionus*, *E. h. luteus*, *E. h. kulan*, *E. h. khur*, *E. h. onager*, *E. kiang kiang*, *E. k. holclereri* and *E. k. polyodon* (Shah 1993, Ryder and Chemnick 1990). The Indian wild ass (*E. h. khur* Lesson

1827) is one of the five surviving subspecies of *E. hemionus* and is endemic to the Rann of Kutch. During the 20th Century, the Indian wild ass had a fairly wide distribution in the dry regions of northwest India and west Pakistan. The wild ass of Sind (*E. h. khur*) was hunted by the great Moghul Emperor Akbar, on the banks of the Sutlej river in 1571 (Rao 1957). The wild ass population declined gradually over the centuries, but there was a drastic reduction between 1960 and 1969, due to an outbreak of the South African Horse Sickness and the arthropod-borne *Surra* disease (Gee 1963). The species is now in the Red Data Book as per the IUCN Threat Criteria.

¹Accepted February, 2001

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STUDY AREA

METHODS

The Little Rann of Kutch, Gujarat State, is an unique saline desert, synonymous with the Indian wild ass, the only gene pool of *E.h. khur* in the world. To conserve this animal, an area of 4,954 sq. km in the Little Rann, its fringe areas and some *beyts* (islands) in the Great Rann of Kutch were declared as the Wild Ass Sanctuary in 1973. Kutch, Banaskantha, Mehsana, Surendranagar and Rajkot districts, and Gulf of Kutch constitute the boundaries of the Sanctuary. Recognising its uniqueness and ecological significance, the area has been listed by the Government of India, among the first 13 areas identified for conservation as Biosphere Reserves, which is pending with the Gujarat State Government for a final declaration as the Little Rann Biosphere Reserve.

The Rann is characterized by a dry tropical climate with a brief erratic monsoon, hot summer and cold winter. The silt-laden inundation from rivers like the Banas, Saraswati, Rupen, and several small seasonal streams, along with high tides from the Gulf of Kutch through Surajbari creek, have contributed significantly towards the formation of this saline flat. The Little Rann gets flooded under 0.5 m to 1.0 m water every monsoon. Though a major part of the Rann changes into dry mudflats after November, numerous water bodies support a large number of resident and migratory birds in winter.

The Sanctuary is classified into: (i) the Rann (3,464 sq. km), (ii) *beyts* (185 sq. km), and (iii) fringe areas (1,304 sq. km). Seventy-four elevated plateaus or islands (locally called *beyt*) were identified through remote sensing, of which 51 *beyts* were vegetated, whereas the rest were barren. The area of the *beyts* varies from 4.7 ha — *beyt* Panchham to 3,050 ha — *beyt* Pung. Six *beyts* have an area of over 1,000 ha. Nanda is the only *beyt* with human habitation and cultivation. About 33% of the *beyt* area is under *Prosopis chilensis*, while herbaceous vegetation constitutes 23% of the net area.

The GEER Foundation conducted a comprehensive ecological study in the Wild Ass Sanctuary from November, 1997 to February, 1999. The author coordinated the study and the paper is primarily an analysis of the field data collected by the scientists and research assistants during this study. The Rann, fringe area, *beyts* of the Sanctuary and Khadir *beyt* were surveyed. Remote sensing study was carried out to know the vegetation cover and habitat conditions.

The Sanctuary area was divided into three regions and seven zones - south fringe, eastern fringe, northern fringe, western fringe, creeks, *beyts* and part of the Sanctuary in the Great Rann. Vehicular and foot transects were done to collect evidence of the occurrence of wild ass. Dung was recorded in all the transects. Locals were questioned to collect more information.

An 18 day count of the wild ass in and around the Little Rann was done in November, 1998. The Great Rann and other habitats were also surveyed to estimate the dispersed population. Data from the wild ass census by the Gujarat Forest Department on January 28 - 29, 1999 was also used. To count wild ass, the Sanctuary and its fringe areas were divided into three regions- (i) *Halwad-Dhrangadhra region*: fringe zones in Surendranagar and Mehsana district, the Rann and *beyts* near the boundaries of two districts; (ii) *Radhanpur region*: fringe zone in Banaskantha, the Rann and *bets* of the Little Rann and Great Rann of Kutch near the boundary of Banaskantha district; and (iii) *Bhachau region*: both sides of Surajbari-creek, fringe area of Rajkot and Kutch districts, the Rann and *beyts* near Kutch and Rajkot districts.

Wild asses were counted on some of the important *beyts* in the rainy season in 1998 to study the breeding area. Pung, Dhut, Nanda, Shedwa, Mardak, Fatehghadh, Nada, Khadir and other *beyts* in the Great Rann were surveyed extensively in November-December, 1998.

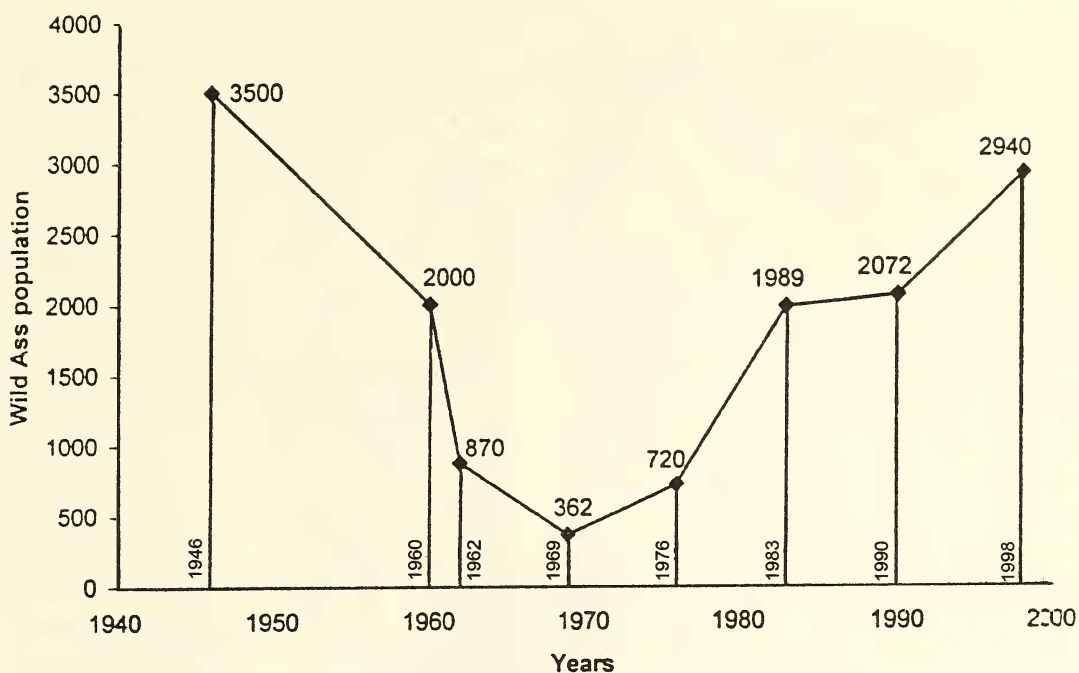


Fig.1: Trend in wild ass population during the last 50 years in the Little Rann of Kutch

Observations were made up to the border of Rajasthan and Pakistan.

RESULTS AND DISCUSSION

Population Trend: Ali (1946) estimated the wild ass population between 3,000 and 4,000 in the Little Rann. In 1960, he estimated a population of about 2000 *khurs*. In 1958 and 1960, the arthropod borne *Surra* disease caused by *Trypanosoma evansi* had taken its toll (Gee 1963). In November-December, 1961, some wild asses died in an outbreak of South African Horse Sickness, reducing the population to 870 individuals in 1962 (Gee 1963). The Gujarat Forest Department recorded 362 wild ass in 1969 in an aerial survey. Since then, the Gujarat Forest Department has conducted four censuses and found that the population increased consistently from 720 in April 1976, to 1,989 in April 1983, 2,072 in March 1990, and 2,839 in January 1999. The comparatively low increase from 1983 to

1990 was probably due to a severe drought from 1985 to 1987.

The GEER Foundation conducted systematic counting of wild ass in and around the Little Rann in November 1998, up to 5-10 km from the Sanctuary boundary. A total of 2,446 animals were counted, not including the wild ass inhabiting the Great Rann and the outer zone beyond 10 km from the boundary. Partial counting was done in and around Khadir, Tragdi, Fatehgadh, Nada and other *beyts* in the Great Rann. Two groups were also counted near Nalsarovar and Dhandhuka-Dholera Highway in Ahmedabad district. On the basis of partial counting, reports of forest officials and locals, it was estimated that over 490 wild asses were dispersed in the Great Rann and in outer areas beyond 10 km south from the boundary of the Sanctuary, up to Dhandhuka (Bhal region). Thus, the total population estimated by the Foundation in November, 1998 was 2,940. The Little Rann and its surrounding zones had not

experienced severe drought as in 1987. This is one of the main reasons for the consistent rise in population at 4.8% per year (1990-1998). The Gujarat Forest Department census in January, 1999 estimated the population at around 2,900.

Population Distribution: The study estimated a total of 1,780 wild ass in Dhrangadhra-Halwad region, 590 in Bhachau and 570 in Radhanpur. It was noted that 390 to 490 wild asses stayed beyond 10 km from the boundary of the Sanctuary. Also, about 70% of the total population is found in Dhrangadhra/Halwad zone (eastern and southern fringes along with Rann, *beyts* and other areas near these fringes). Distribution pattern also revealed that the dispersed population was on the rise.

Distribution of wild ass population varied from season to season as wild asses congregated in the fringe areas and on the *beyts* during monsoon. Although their movement was restricted during monsoon, they were observed moving from *beyt* to *beyt* and from fringe to *beyt* wading in shallow water. Three hundred and fifty-eight wild asses congregated on Pung *beyt* and its neighbouring *beyts* during monsoon in October 1997. This is because groups from fringe areas moved to the *beyts* during the breeding season. Ali (1946) also mentioned congregation of about 200 wild ass on Pung *beyt*. The area-wise distribution of wild ass is given in Table 1.

Dispersal/Migration: In 1976, the wild ass was restricted to a 5 km belt from the Sanctuary fringe (Shah 1993). Animals migrated to areas beyond 10 km from the southern Rann fringe in 1989. South-eastern fringes are rich in food and water resources — maximum concentration of population and dispersal was observed in the peripheral villages in these fringes. People believe that wild asses started moving away from the Sanctuary after the 1987 drought. During our survey, 38 individuals were seen on Khadir, Bangara and Kakidiya *bets* northwest of Khadir, and over 60 wild asses were estimated on and around Khadir *beyt*. The local

people confirmed that wild ass was not seen in this area 15-20 years ago, but is consistently seen in increasing numbers now. During the same period (November-December, 1998), 53 wild asses were encountered in part of the Sanctuary in the Great Rann (26 in Fatehgadh, and 27 in Nada and other *beyts* near Rajasthan). Eighteen wild asses were also seen in March, 1999 on Tragadi *beyt* which is located about 15 km west of Dholavira (Khadir). Dr. Ketan Tatu (*pers. comm.*) observed a herd of twelve wild asses in Kala Dungar area in the western part of the Great Rann in February, 2000; and the villagers have seen this group for the last 3-4 years. He photographed these animals as part of evidence for a study of GEER Foundation in the Great Rann. Three wild asses (two adults and one foal) were seen at the Rajasthan border area. Border Security Force (BSF) personnel claimed to have seen a group of 9 individuals in Rajasthan. A track from Bela to Tuta towards the Pakistan border indicated that animals visited the border, which was confirmed by the BSF personnel.

Some wild asses had migrated out of the Sanctuary to Nalsarovar Bird Sanctuary and Bhal area. Sightings were also made near Dhandhuka-Dholera highway. A group of 18 wild asses was recorded near Kalatalav in the monsoon of 1998, south of Nalsarovar and another group of

TABLE 1
AREA-WISE POPULATION DISTRIBUTION
IN NOVEMBER, 1998

Area	Population	Percentage (%)
Rann	688	23.4
<i>Beyts</i> in the Rann	541	18.4
Fringe areas (vegetated zone in fringe up to 10 km from boundary)	1,271	43.2
Dispersed population beyond 10 km from boundary of Sanctuary (estimate)	440	15.0
Total	2,940	100.0

Note: Wild ass population on *beyts* was 488 individuals in the Little Rann and 53 individuals in the Great Rann.

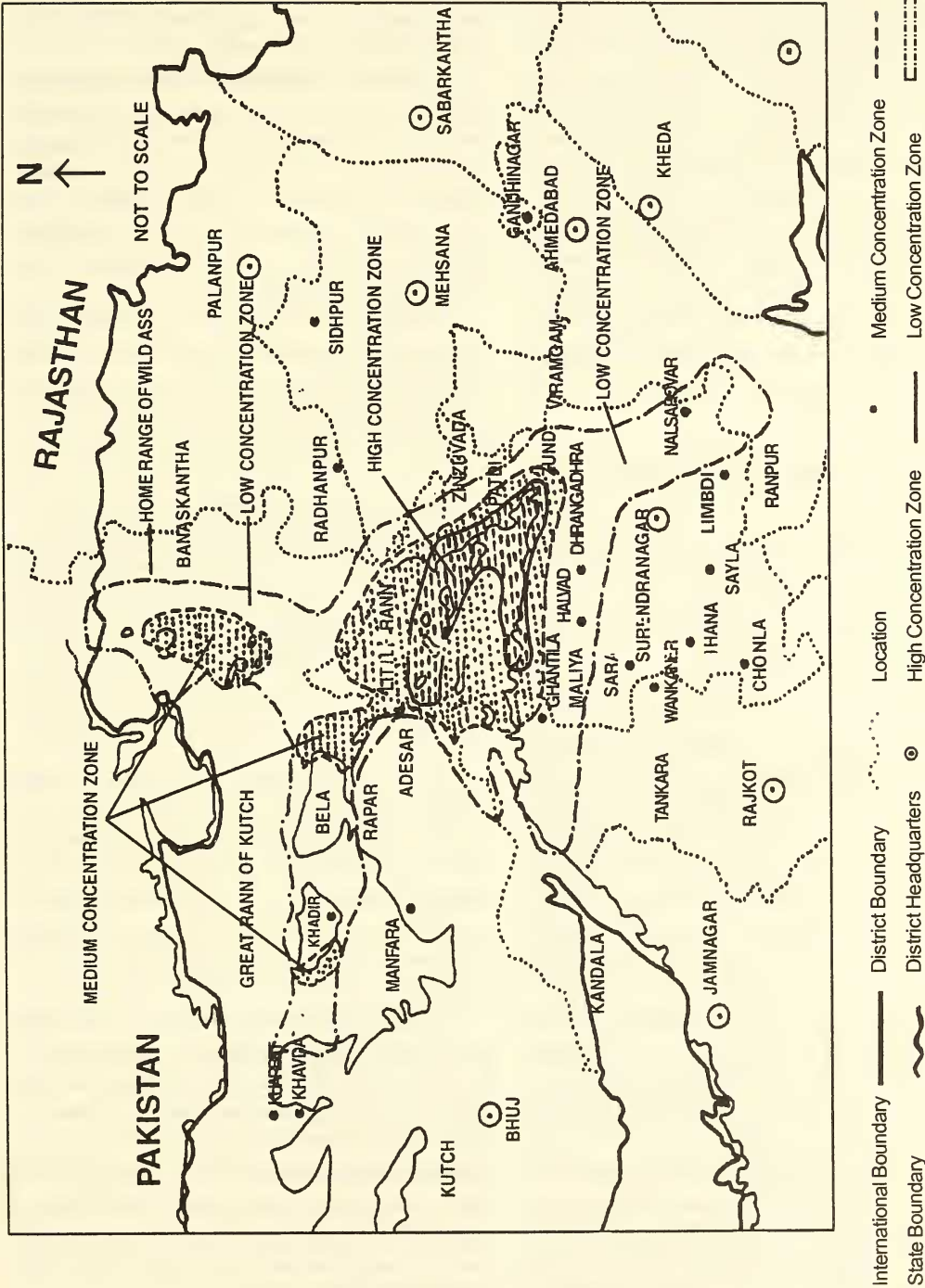


Fig. 2: Distribution of the Indian wild ass

6 animals was seen near Devadthal during the same period. It was also seen near the Limbdi-Vadodara highway. The wild ass census and this survey established the fact that wild ass had dispersed northwards to the Rajasthan and Pakistan border, Dhandhuka-Dholera highway and to the south of Limbdi-Bagodara national highway in the south and Malia in the west.

Population Characteristics: Mating and foaling in the Little Rann occur during monsoon (July–October), which is also a period of vegetation growth. All births are single. Male foals are weaned at 1-2 years of age, while female foals continue to remain with mares for longer periods (Shah 1993).

Of 2,446 wild asses counted in and around the Little Rann, there were 637 males, 1,402 females and 407 foals. It is possible that some of the subadult males could not be distinguished from females and hence the male population was underestimated. But this observation confirms the finding of Shah (1993) that the male:female ratio was 1:2 in the Sanctuary.

Drought certainly affects reproduction. The area did not face severe drought after 1987, therefore the population consistently increased from 2,072 in 1990 to 2,940 in 1998. Out of 407 foals counted in November 1998, 267 were born in the monsoon of 1998. Thus, foals constituted 16.6% of the total population of wild ass (young foals 10.5%). It is difficult to distinguish a one-year foal from a subadult. Thus, some young of the previous year could not be included in the list of the foals. In addition to the 267 foals in and around the Sanctuary in 1998, about a dozen foals were seen in the outer zones in the Great Rann, Rajasthan and Bhal region in the same year. Thus, it may be concluded that more than 275 foals were born in 1998.

Large herds of wild ass were recorded at Visnagar 89, Koparni 86, between Kanach and Thala Rann 70, Kidi 68 and Degam Rann 61. Nearly 60% of the total were recorded in small to medium groups of 3-20 or 21-40, and 36% in

large groups (41 to 90). About 1.8% wild asses, mainly males, were single, whereas 1.5% of the total population were seen in pairs.

Habitat Utilisation: Habitat utilisation pattern of wild ass in and around the Sanctuary zone was studied separately. The pattern changed when peripheral villages were included with the Sanctuary for analysis. Daytime distribution of wild asses in and around the Little Rann in November, 1998 up to about 10 km from the boundary is given in Table 2.

Analysis of the data showed that over 40.0% of all the animals sighted were recorded in the barren Rann, which does not support vegetation. The percentage came down to 29.3% when the population in the fringe areas

TABLE 2
HABITAT-WISE DISTRIBUTION OF WILD ASS
IN THE SANCTUARY IN NOVEMBER, 1998

Habitat type	No. of wild asses	Percentage
Rann	716	29.3
Grass/ <i>Suaeda</i> /herbaceous cover	660	27.0
Sparse <i>Prosopis</i> cover in grassland	690	28.2
Moderate to dense <i>Prosopis</i> cover	229	09.3
Cultivated fields	151	06.2
Total	2,446	100.0

outside the Sanctuary was also counted with that of the Little Rann. This proves beyond doubt that, although a large area of the Rann does not provide food, it does provide space for resting and movement. Vegetation types, grass *Suaeda* types and *Suaeda* with sparse *Prosopis* cover were other preferred habitats of the animal.

Forage, water and safe area for breeding and resting are important habitat components for the wild ass. Preference for different habitats differs in all three seasons, though habitats of sparse and medium *Prosopis* cover were used in all seasons in the day as well as at night (Shah, 1993). Distribution pattern will be different, as animals from fringe areas move to agricultural fields at night during winter and summer in search of food and water.

Population Management: The population of wild ass in the Little Rann for long term conservation needs to be well above 2,500 as prescribed by the IUCN/SSC Equuids Specialist Group (Duncan 1992), the minimum viable population for areas where population is confined to one location. Population of wild ass in and around the Sanctuary has already crossed this number. Animals make regular raids in crop fields in winter and summer, causing resentment among farmers. Farmers regularly complain and demonstrate against the loss of crops (cotton, wheat, gram) and this problem is increasing due to increase in population of wild ass, bluebull, and wild boar in and around the villages.

Although the *khur* population is increasing gradually, it may ultimately reach the levels estimated by Ali (1946) in the near future and would become difficult to manage in the limits of the Sanctuary due to the changed conditions. Original vegetation of grass/herbaceous land and sparse thorn forest of indigenous species is now being invaded by *Prosopis chilensis* in major parts of the vegetated zone. This has reduced the availability of food. Moreover, disturbance due to salt panning and transport, target practice by the Indian Army, and livestock grazing, have added to the factors responsible for habitat degradation. It is difficult to maintain the original carrying capacity of the area without improving the habitat and conservation status of the Sanctuary.

As the area has not faced a severe drought or disease after 1987, the population of wild ass has grown annually. Growth trend in the last decade revealed that this annual rate of growth may be the upper limit of population increase for wild ass in the Little Rann, given the long gestation period and other reproductive characteristics. If this trend continues with the absence of a severe drought or disease, the population may exceed 4,000 by 2010 AD. The trend also indicates that the maximum increase of population would be in peripheral villages and

dispersal zones, leading to migration into new areas of the Great Rann, Bhal and desert parts of Rajasthan. Bhal may support no more than a moderate population of wild ass, as man-wildlife conflict would become serious when the population increases. *Beyts* and fringe areas support a good number, by accommodating more wild asses in new areas in the Great Rann. Wild ass has already reached the Rajasthan-Pakistan border area. Hence, the Thar Desert in Rajasthan may prove to be important in accomodating excess populations. The time has come to explore the possibility of development of the Thar Desert near the border as an alternative site for the Indian wild ass. As these animals were found in historical times in the desert, their natural dispersal into the original habitat should not be a problem.

CONSERVATION STRATEGY

In the absence of a settlement and demarcation of the Sanctuary, adequate protection could not be enforced, which resulted in legal disputes and conflicts as various stake-holders claimed right of use of areas. Settlement work is under progress, but it needs to be completed without further delay. Salt preparation continued in the Sanctuary and expanded to new areas in the absence of regulations. About 28.6 lakh tonnes of salt was produced annually (in 1996) and the leased out area in the Sanctuary increased from 166 sq. km in 1973 to 461 sq. km in 1995. Over one thousand vehicles ply everyday in the salt production season, causing serious disturbance to wildlife. Salt panning — salt ponds created for evaporation — should be restricted and regulated within demarcated zones with fixed transport routes. The Army continues to use an extensive leased area of 217 sq. km near Tikar for target practice. Movement of tanks and army activities should be restricted in the demarcated zone. They should not use the *beyts* as targets, but erect concrete pillars (Singh *et al.* 1998).

Invasion of *Prosopis chilensis* should be controlled on *beyts* and in fringe areas. Original habitat conditions should be restored by uprooting this species from some of the areas faster than its invasion rate of 677 ha/year. High density of cattle dung (334/ha) was observed on the northern fringe, followed by 276/ha on the western fringe, 274/ha in western creek area, 194/ha on *beyts* and 170/ha on the southern fringe (Singh *et al.* 1998). Cattle dung density was high in all the zones, indicating intense grazing. Critical habitats, especially those important for breeding, need to be protected from cattle grazing.

Disturbance in the Sanctuary and expansion of agriculture resulted in the movement of wild ass from the Sanctuary to crop

fields. The conflict between wildlife and local people is increasing in the fringe area due to crop raiding by wild ass. Land use patterns will change rapidly after irrigation of land from the Narmada canal, which is likely to cause some impact on the ecology of the Sanctuary and its surrounding areas. This should be studied properly by carrying out an environmental impact assessment. Environmental education, habitat improvement and ecodevelopment programmes could be long-term strategies of conservation.

There is no harm in capturing some animals straying into villages to meet the demand of zoological parks. Simultaneously, efforts must be made to find alternative sites for wild ass in the Great Rann, Thar Desert and Bhal area as part of the long-term conservation strategy.

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